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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,304	03/25/2005	Roger Guevremont	151-16 US/PCT	2126
25319	7590	10/18/2006	EXAMINER	
FREEDMAN & ASSOCIATES 117 CENTREPOINTE DRIVE SUITE 350 NEPEAN, ONTARIO, K2G 5X3 CANADA			JOHNSTON, PHILLIP A	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<p><b>Application No.</b></p> <p align="center">10/529,304</p>	<p><b>Applicant(s)</b></p> <p align="center">GUEVREMONT, ROGER</p>	
	<p><b>Examiner</b></p> <p align="center">Phillip A. Johnston</p>	<p><b>Art Unit</b></p> <p align="center">2881</p>	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11-03-2005</u> . | 6) <input type="checkbox"/> Other: _____  |

**Detailed Action**

**Claims Rejection - 35 U.S. C. 102**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

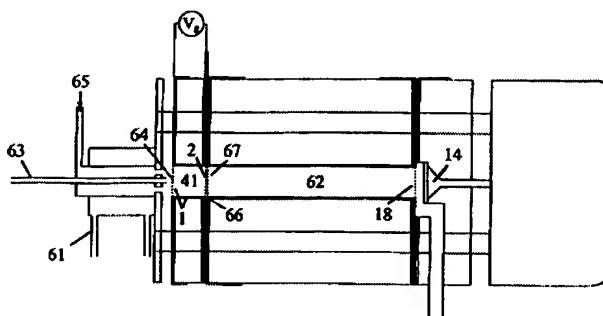
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6,8,11,12,14,17-22,25-34,36,37, are rejected under 35 U.S.C.

102 (b) as being clearly anticipated by Spangler, U. S. Patent No. 6,124, 592.

3. Regarding Claim 1, Spangler teaches a number of ion mobility spectrometer (IMS) and trap (IMST) designs, where high field strength asymmetric waveforms (FAIMS mode) are applied to electrodes for ion separation (Col. 8, line 53-65; Col. 12, line 17-60; and Col. 14, line 1-11), and where an AC (RF) only mode is utilized to extract ions from the trap. Col. 7, line 43-63; Col. 23, line 5-65.

In one particular example, the applied asymmetric AC and DC voltage focuses and stores the ions at specific locations within trap volume 41, after which the asymmetric AC potential is removed and an accelerating potential is applied across electrodes 1 and 2, causing the ions to be injected into drift tube 62 for subsequent mobility analysis. See Col. 25, line 65-67; Col. 26, line 1-6; and Figure 38 below.



**FIGURE 38**

4. Regarding Claims 2,4,20-22, and 25, Spangler teaches trapping ions in an IMST where ions from a source are focused through a lens (note Fig. 5 and 38 above) into a quadrupole (parallel rod) trap by first applying an RF voltage (first mode), then asymmetric AC and DC potentials are applied (second mode) across the electrodes and scanned by controller 13 which causes the ions to migrate towards an equilibrium position within the trap volume, and subsequently ejecting ions by applying a combination of RF and DC potentials to the electrodes. See Col. 5, line 28-33; Col. 9, line 50-67; Col. 10, line 1-5; and Figure 10A.

5. Regarding Claims 3 and 6, Spangler teaches turning off the asymmetric AC potential prior to ejecting the separated ions and removing the ions from volume 7 using scan controller 13, the high voltage power supply 19 and switches 20 and 21 remove the ions by temporarily applying an accelerating potential across the electrode structure of the trap. Col. 10, line 18-31.

6. Regarding Claims 14,26,27,30, and 31, Spangler teaches the use of parallel rods in quadrupole, hexapole, and octapole ion mobility analyzer/trap structures. Col. 4, line 27-48; and Col. 5, line 63-67.

7. Regarding Claims 5 and 8, Spangler teaches continuous filling or refilling during the separation and extraction periods. See Fig. 18; Col. 15, line 23-33; and Col. 23, line 39-55.

8. Regarding Claims 28,29, and 37, Spangler teaches switching potentials applied to the mobility analyzer (trap) region as described above regarding claims 3 and 6, and that the trap volume is filled with a neutral gas (bath, carrier, or drift), where

the ions experience energy loss due to collisions (collisional cooling) which promotes separation based on mobility. Col. 1, line 10-32; Col 15, line 56-64.

9. Regarding Claims 11,12,32,33, and 36 Spangler teaches changing AC or DC potentials and/or phase of the asymmetric potential prior to extracting ions to a detector. Col. 6, line 3-50; Col. 14, line 61-63; Col. 15, line 34-44.

10. Regarding Claims 17-19, Spangler teaches operating the trap at pressures of at least  $5 \times 10^{-3}$  to Atmospheric pressure. Col. 21, line 24-31.

### ***Claims Rejection – 35 U.S.C. 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 7,9,10,13,15,16,23,24, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,124,592, to Spangler, in view of Whitehouse, U.S. Patent No. 7,034,292.

13. Regarding claims 7,9,10, and 13, Spangler teaches all the required limitations therein, as pointed out above regarding claims 1 and 20; as well as 5 and 8.

14. Spangler fails to teach confining ions to a smaller volume due to collisional cooling.

15. Whitehouse teaches that collisional focusing creates a narrower beam profile (smaller volume than occupied prior to collisional cooling). Col. 25, line 29-35.

16. Whitehouse modifies the Spangler method to provide collisional focusing.

17. Therefore it would have been obvious to one of ordinary skill in the art that the ion mobility analyzer and trap of Spangler can be modified to use collisional focusing in accordance with Whitehouse, to provide for precise ion focusing through the lens' and into the time of flight pulsing region.

18. Regarding claims 15 and 23, Spangler teaches all the required limitations therein, as pointed out above regarding claims 1 and 20.

19. Spangler fails to disclose the use of a plurality of rod segments.

20. Whitehouse teaches the use of a multipole ion guide operated in RF only mode, where the multipole ion guide is configured with plural segmented rods (Note Figure 14). See Col. 18, line 57-64.

21. Whitehouse modifies the Spangler method to provide segmented rods.

22. Therefore it would have been obvious to one of ordinary skill in the art that the ion mobility analyzer and trap of Spangler can be modified to use the segmented rods in accordance with Whitehouse, to provide an axial voltage along the rod segments, thus providing a force component to aid in moving ions through the ion guide volume to reduce transmission losses.

23. Regarding claims 16,24, and 35, Spangler teaches all the required limitations therein, as pointed out above regarding claims 1 and 20.

24. Spangler fails to disclose the use of different voltages between different rod segments including a DC gradient along the segments.

25. Whitehouse teaches the use of a multipole ion guide operated in RF only mode, where ion guide segments provide electrical and functional decoupling of adjacent segmented ion guide rod sets, where some or all can be driven by separate power supplies (Note Figure 2A and 2B; and Col. 28, line 35-55). Whitehouse further teaches the use of a DC gradient applied along the axis of plural rod segments. Col. 42, line 3-18.

26. Whitehouse modifies the Spangler method to provide segmented rods which are electrically and functionally isolated to allow ions to pass between ion guides or to trap ions in ion guides with gated release into adjacent ion guides or the downstream mass to charge analyzer.

27. Therefore it would have been obvious to one of ordinary skill in the art that the ion mobility analyzer and trap of Spangler can be modified to use the segmented rods in accordance with Whitehouse, to provide an axial voltage along the rod segments, thus providing the ability to conduct multiple ion fragmentation, mass to charge selection and scanning functions in plural ion guides

### ***Conclusion***


28. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to

reach the examiner by telephone are unsuccessful, the examiners supervisor Drew Dunn can be reached at (571)272-2312. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

September 25, 2006



David A. Vanoie  
Primary Examiner  
Art Unit 2881